INSULATING FACE MASK

ABSTRACT

An insulating face mask of elastic material having a mask member that fits securely about the forehead, face, gullet and ears of a user by co-action of securing straps that extend rearward from the ear areas and join at the rear of the head at the base of the skull, and wherein said mask member and straps overall form a vee-shaped contour about each side of the user's head.

BACKGROUND

Field of the Invention

This invention relates to apparel. In particular this invention relates to a face mask that insulates the user's face from harsh atmospheric conditions, such as cold weather, wind, rushing air, airborne particulates, rain and water.

State of the Art

A variety of head gear is known to insulate a user's face from inclement weather. For example, U.S. Patent 6,272,690 B1 (Carey) discloses a head covering attached to a substantially surrounding head covering; and U.S. Patents 4,825,474 (Edwards) and 4,300,240 (Edwards) disclose a cold weather face mask covering the cheekbone area and below as well as various aspects of the sides and back of the head.

The insulating facial wear heretofore known, such as those disclosed in the above referenced patents, seek to provide insulation and protection of face against cold weather and wind by loosely and substantially covering the entire head (Carey), or instead, by partially covering the face only as high as the top bridge of the user's nose allowing for other apparel to be used in the outdoor environment (Edwards').

SUMMARY OF THE INVENTION

The instant invention relates to an insulating face mask having a mask member formed of an elastic and insulating material. The mask member is sized and shaped to fit snugly about the forehead, face, gullet and ears of a user with a top perimeter proximately and contoured along the juncture where the top of the forehead meets the scalp, and a bottom perimeter in the gullet area extending proximately along the intersection formed between the neck and the underside of the jaw, each said perimeter extending in width to just past the left and right ear areas, and a height defined by vertical distance between the top and bottom perimeters.

The mask member has a first aperture allowing the user to see, a second aperture allowing the user to breathe through the nostrils, a third aperture allowing the user to breathe through the mouth and speak, and a fourth aperture set, one for each ear, allowing the user to hear sounds.

The material of the face mask continues beyond each of the left and right ear areas, taking shape in the form of securing straps. The straps have top and bottom edges that extend generally in-line with the respective top and bottom perimeter contours of the mask member, and thus taper as the straps continue rearward to and about the lower hemisphere of the head and meet in the back of the head at the base of the skull. The securing straps secure form a band with the mask member to secure the mask member to the user's forehead, face, gullet and ears and form a seal between the user and the mask member's top and bottom perimeters, as well as along the perimeter of the preferred first aperture means for the user's eyes.

In a preferred arrangement the securing straps are have ends with respectively co-acting fasteners adapted to each end for removeably fastening the strap ends at the back of the head at the base of the skull.

In another preferred arrangement the face mask material continues upward from the top perimeter and takes shape in the form of a crown member that is proportionally shaped and sized to fit the top, or cap-wearing, part of the head.

In yet another preferred arrangement, the second aperture means for the nostrils is formed with the material of the mask member so as to form a diaphragm member having left and right flaps open to the atmosphere alongside the respective left and right sides of the nose. The diaphragm member is contoured to fit over the nose with flap edges flaring in width along the length of and beyond the tip of the nose. The flaps are pitched open on each side of the nose, and rest open to the atmosphere under no oncoming-wind like conditions.

A method of fabricating the aforementioned insulating face mask starts with supplying a sheet of insulating and elastic material and positioning the sheet in a two-dimensional flat plane. The steps include supplying at least one cutting means and using the same to cut the flat sheet to form seam edges, peripheral edges and aperture openings into a two-dimensional and substantially symmetrical flat filet wherein the two-dimensional filet is pre-planned in design so that when joined along the seam edges, it forms any one of the aforementioned three-dimensionally shaped face masks. The method involves manipulating the cut two-dimensional filet away from the remaining portions of the sheet, and joining the respective seam edges of the filet to form of the three-dimensional contoured face mask. The method also requires the supply of at least one securing means and adapting same to secure the joined seam edges.

A method is also claimed on how to form the aforementioned diaphragm member as the second aperture means in the 3-dimensional face mask. During the cutting operations the narrow top edge of a substantially trapezoidal shaped flange is unitarily formed with the mask member at the juncture proximate the area corresponding to the top of the nose bridge, flaring in width to the wide base distal edge of the flange. The distal wide base edge is then joined to the mask

member in a selectable substantially horizontal plane between the second and third apertures and in a final step the method requires the supply and adaptation of a securing means to secure the trapezoidal flange to the mask member along the joined wide base distal edge thus forming the two-flap three-dimensional diaphragm member.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawings illustrate the best modes presently contemplated for carrying out the invention.

FIG. 1 is a front view of an insulating face mask of the instant invention positioned on a user.

FIG. 2 is a left side view of the insulating face mask in FIG. 1 positioned on a user.

FIG. 3 is a rear view of the insulating face mask in FIG. 1 positioned on a user.

FIG. 4 is a left side view of the of the insulating mask shown in FIG. 1.

FIG. 5 is a front view of an insulating face mask of the instant invention including a diaphragm member and a crown member, positioned on a user.

FIG. 6 is a left view of an insulating face mask in FIG 5, positioned on a user.

FIG. 7 is a rear view of an insulating face mask in FIG 5, positioned on a user.

FIG. 8A is a front view of the 2-dimensional flat filet design for the 3-dimensional face mask shown in Fig. 1.

FIG. 8B is a front view of a 2-dimensional flat filet design for the 3-dimensional face mask having a diaphragm member.

FIG. 8C is a front view of a 2-dimensional flat filet design for the 3-dimensional face mask having a crown member.

FIG. 8D is a front view of a 2-dimensional flat filet design for the 3-dimensional face mask shown in Figure 5.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings, the insulating face mask is mounted to the head and face of a user, generally depicted by the number **100** appearing in FIGS. 1 and 2. When worn, the front facial view of a user is substantially subsumed by the mask member **10**, as shown in FIG. 1.

The face mask is formed of an elastic and insulating material. The best mode for practicing the instant invention utilizes neoprene, a stock rubber based composite layered on one or both sides with synthetic fabric. Thicker or thinner stock materials can be used to respectively increase or decrease the insulating factor. For example, an appropriate thinner non-composite material such as spandex can be used. Various fabric laminates on the interior and exterior of the material may be used to accommodate comfort factors. Various colors, patterns, graphics and designs, particularly on the exterior surface, may be utilized to enhance or adapt the mask to surrounding environmental conditions such as to create the effect of visual contrast or camaflouge to the environs, or to absorb or reflect external radiant heat, or to display fanciful graphics for sport use or team identity.

As shown in FIGS. 1-2 the mask member **10** is sized and shaped to fit snugly about the forehead **11**, face **12**, gullet **13** and ears **14** of a user. A top perimeter **16** of the mask member 100 is proximate and contoured along the juncture where the top of the forehead meet the scalp. From each side of a midline **M-L** on the user's face, the top perimeter **16** extends symmetrically to a distance to just past the left ear **½ TW**, and just past the right ear **½ TW**, and together constitute the entire width of the top perimeter **16**.

The mask member 100 also has a bottom perimeter **17** in the user's gullet area. The bottom perimeter **17** is proximately along the intersection formed between the user's neck and underside of the jaw, which from each side of a midline **M-L** on the user's face, and extends symmetrically to a distance to just past the left ear **½ BW**, and just past the right ear **½ BW**, and which together constitute the entire width of bottom perimeter **17**.

The vertical height of the mask member varies and is defined by the vertical distance between the top perimeter **16** and the bottom perimeter **17**. The length of the mask height is a maximum at the face midline **M-L**, and gradually and symmetrically decreases along the each side of the mask member in approach toward the mask member's distal width perimeter just past the ears, whereat the height is at a minimum. The gradual decrease in the mask member's height forms a taper or 'vee' shape, most pronounced in the lateral views of FIG. 2 and FIG. 4.

The mask member also has a first aperture for user's eyes allowing the user to see. In the preferred embodiment, the first aperture **31** is formed by an open 'lazy-eight' cut-out to provide, without compromising excess exposure of the user's skin to the atmosphere, maximum visual acuity and flexibility to adjust the mask material over the bridge of the nose. The preferred 'lazy-eight' cut out also readily allows and does not interfere with the option for a user to don over the face mask a supplemental streamlined eye goggle or larger eye mask.

What is more, is that the support to the mask member lent from the forehead aspect **11** of the mask member **10** relieves pressure on the user's nose bridge that was inherent in earlier known mask designs having their topmost perimeter across the cheekbone-temple juncture. The instant invention alleviates that pressure imposed in the nose bridge by earlier designs, and provides a better overall secure fit.

The mask member has a second aperture to allow the user to breathe through the nostrils. One preferred embodiment for the second aperture, is achieved by a horizontal slit **32H** in the

mask member positioned below the tip of the nose and above the mouth allowing the mask member material to freely contour over the user's nose and form a pitched opening **32O** in the mask member allowing the user's nostrils to directly register and pass air with the environment without impinging against the mask material.

In another preferred embodiment, shown in FIGS. 5 and 6 the second aperture means is a diaphragm member **90** for the nostrils is formed by two symmetrically opposed vertically oriented slits **32LS** and **32RS** formed in the mask member material, respectively starting just outside the left and right sides at the top bridge of the nose, and extending downward and flaring apart alongside the respective left and right sides of the nose, each to a distance ending beyond the tip of the nose and above the mouth. The slits **32LS** and **32RS** allow the mask member material to freely contour over the user's nose and form pitched diaphragm openings respectively along the left side **32LO** and right side **32 RO** of the nose. The air passed from the user's nostrils impinges against the interior side of the left flap **32LF** and right flap **32RF** in proximity to the nostrils, and eventually passes to the environment via the openings **32LO** and **32 RO**.

The flaps **32LF** and **32RF** are urged toward the mask member **10** by either rushing air at or wind against the user's face, thus decreasing the open area of the respective left and right slit openings **32LO** and **32 RO**. This operation of the flaps **32LF** and **32RF** produces the diaphragm effect to reduce the amount of rushing air or wind imposed on the face through the respective openings **32LO** and **32 RO**.

The mask has a third aperture for the user's mouth allowing the user to breathe and speak. In the preferred embodiment a mouth mesh **33** is formed in the mask member material by a predetermined pattern of a plurality of holes. The pattern is on and proximate to the user's mouth, with the holes being relatively small in area in relation to the overall area of the hole

pattern. The aggregate area formed by the holes is sufficient to allow the user to breathe and speak adequately under user activities involving heavy exertion.

The mask has fourth aperture set, one for each ear, allows the user to hear sounds. In a preferred embodiment left **34L** and right **34R** ear meshes are formed in the mask member material by a predetermined pattern of a plurality of holes. Each left and right pattern is on and proximate to the user's respective ear, here again with the holes being relatively small in area in relation to the overall area of the hole pattern. The aggregate area formed by the holes in each respective pattern is sufficient to allow the user to hear adequately under user activities involving heavy exertion.

Beyond each of the left and right ear areas, the face mask material continues and takes shape in the form of a left **50L** and right **50R** securing straps. Each strap has a top edge **56** and bottom edge **57** that extend generally in-line with the respective top **16** and bottom **17** perimeters of the mask member. The height of the straps is defined by the distance between the top **56** and bottom **57** edges. The height is a maximum where the straps contiguously join the mask member **10** at the juncture just behind the left and right ear areas. The height gradually decreases as the straps continue rearward to and about the lower hemisphere of the head and meet in the back of the head at the base of the skull **BB**. The taper formed by the decrease in the length of the strap height generally continues the taper or 'vee' shape of the mask member **10**, thus producing an overall 'vee' shape **VEE** to the face mask most pronounced in the lateral views of FIG. 2 and FIG. 4.

The **VEE** of the face mask **100** in conjunction with the band-like effect created by the loop formed by the securing straps and the mask member securely fits the mask member to the user's forehead, face, gullet and ears even during vigorous activities. The instant invention comfortably arrests relative motion between the user and the face mask **100**, and thus produces

the desired effect of not shifting to interfere with the user's vision, hearing, breathing or speech. In addition, the invention forms a weather and windproof seal between the user and the mask member's top **16** and bottom **17** perimeters, and along the perimeter of the preferred first aperture means **31**.

In a preferred arrangement, the left **50L** and right **50R** securing straps each have a respective left **59L** and right **59R** distal end, each with by a respective left **59LF** and right **59RF** co-acting fastener to removeably fasten the distal ends to each other at the back of the head at the base of the skull. For the fasteners **59LF** and **59RF**, Velcro™, hook-and-hoop, button-and-eyelet and similar items may be utilized.

In yet another arrangement shown in FIG. 5-7 the face mask material continues upward from the top perimeter **16**, and takes shape in the form of a crown member **80** that is proportionally shaped and sized to fit the top, or cap-wearing, part of the head. At the back of the head, an open area between the bottom edge of the crown member **87** and the top edge of the securing straps allows the user's hair to hang freely, particularly long hair, in pony-tail bundle or otherwise.

The crown member **80** enhances the secure fit and insulation capacity of the face mask **100** by obviating the need for supplemental hat-like gear to insulate the top of the head within the normal hairline area, and engages to provide additional support to the mask member **10**. g the head aspect of the, both desired effects during vigorous user activities.

A preferred method to fabricate the aforementioned invention requires the step of supplying a sheet of insulating and elastic material such as that described above - neoprene, spandex or the like. The sheet is positioned in a two-dimensional flat plane and at least one cutting means is supplied and used to cut the flat sheet to form seam edges **41L** and **41R**,

peripheral edges **45** and apertures **46** into a two-dimensional and substantially symmetrical flat filet, as depicted in FIGS. 8-A, 8-B, 8-C and 8-D.

The two-dimensional filet must be pre-planned in design so that when joined along the seam edges **41L** and **41R**, the filet forms any one of the aforementioned three-dimensional face masks. For instance, the filet of FIG. 8-A is the two-dimensional design of the face mask shown in three-dimension in Fig. 1.

The filet of FIG. 8-B is the two-dimensional design of the face mask shown FIG. 8-A but having an added two-dimensional design feature of a trapezoidal flange **95** sufficient to form the preferred second aperture diaphragm member **90** shown in FIGS. 5 and 6. The trapezoidal wide distal base edge **42** of FIG. 8-B is a seam edge to be sewn during the securing step of fabrication.

The filet of FIG. 8-C is the two-dimensional design of the face mask shown in FIG. 8-A but having an added two-dimensional design feature a left **81L** and right **81R** half of the crown **80**. The halves are defined by a left **43L** and right **43R** crown seam edge, which when sewn during the securing step of fabrication, are sufficient to form the three-dimension crown member **80**.

The filet of FIG. 8-D is the two-dimensional design of the three-dimensional face mask embodiment shown in FIGS. 5-7. In addition to the peripheral edges **45**, the entire set of seam edges for that embodiment are identified as **41L, 41R, 42, 43L** and **43R**.

The method also requires the step of manipulating the cut two-dimensional filet away from the remaining portions of the sheet, and joining the respective seam edges of the filet to form of the three-dimensional contoured face mask. Further, the method requires the supply of at least one securing means and adapting same to secure the joined seam edges. The preferred way to achieve the securing step is to sew thread by machine into the face mask material

appropriately along the seam edges to permanently adjoin the seams edges. Glue and heat seals are alternate means to secure the edges.

One particular advantage of the face mask **100** shown in FIGS. 1-4 and 8-A is that only one sewn-stitching is required along the seam edges **41L** and **41R**. The need for only one sewn-stitching serves the multiple purposes of being an economical aspect of manufacture; minimizing the amount of ergonomically irritating ridges to produce greater comfort during use; and providing an aesthetically pleasing feature along the lower part of the midline **M-L** in the finished face mask product **100**.

A method to form a diaphragm as the second aperture means of the face mask is achieved by cutting a trapezoidal flange **95** during the cutting operations, with the narrowest aspect formed unitarily with the mask member at the juncture proximate the area corresponding to the top of the nose bridge. The trapezoidal flange must be shaped to flare in width to the distal wide base edge **42**.

Next, the distal wide base edge of the flange **95** is joined to the mask member in a selectable and substantially horizontal plane between the second (nose) and third (mouth) apertures to form a three-dimensional diaphragm member **90** disclosed above. In a final step, the method to fabricate the diaphragm requires the supply and adaptation of a securing means, such as those securing means disclosed above, to permanently adjoin the joined flange distal wide base edge **42** and mask member **10**.

Minimizing the extent of sewn stitching ridges by the having one sewn-stitching along the diaphragm member **90** seam edge **42** and the crown member **80** seam edges **43L** and **43R** produces the same economic, ergonomic and aesthetic advantages recited above.

The description of the above-illustrated embodiments is not intended to limit the scope of the claims, which themselves are regarded as essential to the invention.